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## WIRELESS ROUTERS

### Move into the fast lane

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The wireless router supplied by your ISP is probably old, slow and unreliable. These 13 models will give you a real speed boost – and they start at just £21

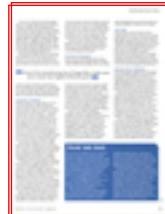
**YOUR WIRELESS ROUTER** isn't the most exciting bit of kit you own, but if it's slow and unreliable it can be one of the most annoying bits of technology. Unfortunately, a lot of us are likely to be lumbered with slow, unreliable routers thanks to the often poor routers that are bundled with new broadband deals.

A BT HomeHub 4, released in 2013, for example, managed a maximum of 46.7Mbit/s in our tests, which is slower than the fastest broadband the company offers. Likewise, the first Virgin Media Super Hub managed just 42Mbit/s in our tests. Both companies have since released newer routers, but with many of us stuck on these or older models, slow throughput and a lack of range are problems we're all likely to have.

Fortunately, there's something you can do about it: upgrade your router. We've reviewed 13 of the latest wireless routers to help you find your perfect model. Thanks to the latest 802.11ac technology, we've seen throughputs of over 150Mbit/s using a USB adaptor, not to mention better range. As you can see, a new router can make a massive impact.

#### STANDARD BEARER

The first thing you need to do when you buy a new router is to work out which type you need. If you have an ADSL connection, you need a router with built-in ADSL capabilities. This connects directly to your telephone line, giving you an internet connection without the need for any additional boxes.



If you're on a fibre service from anyone other than Virgin Media, such as BT Infinity, things are a little more confusing. These services are 'fibre to the curb' (FTTC), which means there's a fibre cable to the green box in the street, but the last leg is run over your copper telephone cables using a technology called VDSL. In addition to a wireless router, this requires an additional box, which is the VDSL router. When you replace your router, you'll need to keep the VDSL unit and opt for a router with an Ethernet WAN port.

If you're with Virgin Media, your existing router will have the fibre modem built-in. As you can't buy routers with integrated fibre modems, you need to leave the old router in place, disable its wireless and attach a second

**“ If you'll be transferring lots of large files, make sure your router has Gigabit Ethernet ports ”**

wireless router, choosing a model with an Ethernet WAN port. Our guide on upgrading your router (page 106) tells you how to switch your ISP's router, while our table (page 108) tells you the type of modem each router has.

#### CHANNEL TUNNELS

Wireless signals are transmitted on one of two bands, 2.4GHz or 5GHz. All devices support 2.4GHz, which is the older standard. This has better range, but suffers from more interference, as lots of devices – including wireless door chimes and baby monitors – also use this spectrum. With 5GHz, you get less range, but less interference, which can dramatically improve performance. For the most flexibility, a dual-band router can run networks on both bands simultaneously, so you can run old and new devices together, using 5GHz when you can. All 802.11ac routers can use both bands simultaneously, but it's rare to see this option on 802.11n models.

Each band is divided into slices called channels. When setting up your router, you have to choose a channel you want to operate your network on, although many routers will automatically pick the best one. If you're having problems with speed or reliability, changing the channel can improve things.

It's important to understand how channels work before you change anything. A channel is a slice of the available spectrum. For example, in a 2.4GHz network channel 1 is a slice from 2.4GHz to 2.422GHz, while channel 2 goes from 2.405GHz to 2.427GHz. This means neighbouring channels overlap, causing interference, so it's best to use only channels 1, 6 and 11, which don't overlap. This has been resolved for 5GHz, which has a larger range of non-overlapping channels, so you simply pick the one with the best performance for you.

Most routers offer the option of channel bonding, whereby they send the signal over two adjacent channels, taking up double the bandwidth. For 2.4GHz, if there are other

networks nearby, channel-bonding is bound to cause interference and can actually degrade performance, so routers are required to have this turned off by default to gain official Wi-Fi certification. Some routers refer to channel bonding as turbo mode, while others talk about speed: for example, 300Mbit/s mode.

There are fewer problems with 5GHz, so channel bonding is a good thing. Typically, 802.11ac routers, which typically refer to the technology as 20/40/80Hz mode, handle channel bonding automatically.

#### I'M WITH THE BAND

Most routers, including all of those we've looked at here, have multiple input, multiple output (MIMO) technology, which uses several

speed, although the actual tested speeds are a better indication of what you can expect.

#### THE WIRE

If you want to connect wired as well as wireless devices to your network, you should pay attention to the type of network ports on offer. Most routers this month have 10/100/1,000Mbit/s (Gigabit) Ethernet ports, but many cheaper routers use 10/100Mbit/s Ethernet ports. Even a 10/100Mbit/s connection is faster than most wireless networks, particularly over distances above 10 metres. However, if you're planning to use network storage and will be transferring lots of large files between devices on a wired network, make sure your router has Gigabit Ethernet ports.

#### PROTECTION & PRIORITY

All wireless routers support Wi-Fi Protected Access 2 (WPA2) wireless network security encryption. It's important to use this, as otherwise anyone can access your network, piggy-backing on your internet connection or even accessing files on your local network. Routers with a pre-set wireless password are secure from the moment you plug them in.

All routers also have built-in firewalls to protect your network from intruders, and all support Universal Plug and Play (UPnP), which automatically opens ports required by devices such as media streamers. If you want to run a service that doesn't use UPnP, such as your own web server, you need to configure port forwarding. This passes traffic on a given port (such as port 80 for web traffic) to a designated PC on your network.

If you use port forwarding a great deal but don't have a static IP address assigned by your ISP, many routers support Dynamic DNS. This automatically updates your URL so it directs visitors to your current home IP address. If your ISP changes your IP address, as many of them do if you switch off your router, the URL updates the new address.

## How we test

We carry out 13 different tests on 802.11ac routers. Our test environment includes common problems encountered when using Wi-Fi in an urban environment, such as lots of potential interference on the 2.4GHz band in particular. Our results are representative of a challenging real-world environment, rather than one designed for optimal performance. A good performance in our tests is a meaningful achievement.

To test throughput, we time how long it takes to copy a 100MB file over the network, which gives us speed figures in megabits per second (Mbit/s).

Most people connect to routers using their laptop's integrated wireless adaptor. In keeping with this, we use a Centrino 2 laptop to connect to both the router's

2.4GHz and 5GHz wireless networks at distances of 1m and 10m away within the same room and 20m away in another room. The same tests are repeated using the same laptop, but with each manufacturer's own USB wireless adaptor, if one is available.

All the 802.11ac adaptors are USB2, which meant that, on our laptop, speeds peaked at 158.45Mbit/s. However, the routers may well have a bit more headroom. Testing using an 802.11ac bridge, which connects to a PC via Ethernet, we've seen throughput of 279.6Mbit/s. This means plenty of these routers have a lot more headroom than you may see now, but as you upgrade and buy a laptop with built-in 802.11ac aerials, or vendors start selling USB3 802.11ac adaptors, you'll see more speed in the future.



## WIRELESS ROUTERS

### ASUS RT-AC56U



£112 inc VAT • From [www.dabs.com](http://www.dabs.com)

#### VERDICT

Excellent 5GHz performance and lots of features, but we'd have liked better 2.4GHz performance

**AS ONE OF** the first manufacturers to make an 802.11ac device, we expect quite a lot from Asus. Its RT-AC56U is certainly off to a good start on paper. With a four-port Gigabit Ethernet hub, Ethernet WAN port, USB and USB3 ports, it's got everything we'd want.

The USB ports mean you can connect a printer or external hard disk to share over a network. More impressively, you can connect a 3G dongle, so you can share a mobile broadband connection, which could be useful if your regular internet connection goes down.

The RT-AC56U is rather stylish, standing upright with no external antennas to spoil its appearance. On the front is a bank of lights that keep you informed on the status of your connection and Wi-Fi. On the right-hand side are buttons for WPS (if you want to join a device with push-button security) and for Wi-Fi, so you can quickly turn off wireless.

Most of the management has to be done through the web interface. Asus's interface is clear and easy to use, with a setup wizard that

helps you secure the open-by-default wireless networks. There are plenty of features, but some are hidden under non-standard names. For example, to enable QoS, you have to click on a tab marked Traffic Manager.

The router isn't happy in 2.4GHz mode, particularly in areas with lots of other signals using the same band. The worst results came using our laptop's integrated wireless adaptor: 38.2Mbit/s at 1m and 36.6Mbit/s at 10m, both of which are acceptable, but we couldn't do the test at 20m. This is disappointing, as most people still use integrated 2.4GHz laptop or mobile chipsets with their wireless routers.

Asus's £60 USB-AC53 USB wireless dongle improved things quite a bit. We managed a connection at 20m, although the 5.3Mbit/s throughput was poor; however, performance at 10m improved to 56.7Mbit/s and throughput at 1m was a blistering 90.1Mbit/s.

Something we couldn't complain about was the router's 5GHz performance. Getting it to work with our laptop's 802.11 Centrino 2



wireless chipset required no tweaking or adjustment at all, and produced speeds of 74.1Mbit/s at 1m, 60.2Mbit/s at 10m and 25.6Mbit/s at 20m. Performance was even more impressive with Asus's USB adaptor: a consistent 158.5Mbit/s at both 1m and 10m, dropping to 66.2Mbit/s at 20m. We got the best performance at 20m by using the £70 Asus PCE-AC68 PCI-E wireless adaptor installed in a desktop PC. With a transfer speed of 81.6, this was one of the fastest throughputs we've ever seen at that distance.

Although the RT-AC56U's performance at 5GHz is excellent, we were disappointed by its 2.4GHz performance in an area cluttered with rival 2.4GHz signals. The BT Home Hub 5 is only a little more expensive and has a similar range of features, making it a better buy.

### ASUS RT-AC68U



£177 inc VAT • From [www.morecomputers.com](http://www.morecomputers.com)

#### VERDICT

This high-end router's price is justified by its astonishingly fast wireless performance

**ASUS MEANS BUSINESS** with its 802.11ac router range. The RT-AC68U uses TurboQAM to take its 2.4GHz Wi-Fi connection up to a theoretical maximum speed of 600Mbit/s, while its 5GHz wireless has a theoretical throughput of 1,300Mbit/s. The router has a Gigabit WAN port so you can connect it to a cable or fibre modem supplied by your ISP.

For connecting other devices, the RT-AC68U has four Gigabit LAN ports, a USB port and a USB3 port, that latter two of which you can use to connect an external hard disk, plug in a mobile broadband dongle to provide an in-case-of-emergency 'net connection, or share a USB printer over your network.

The router's wireless networks are enabled but unsecured by default, so your first step should be to connect to the router's web interface and run through the configuration wizard. This also establishes your internet connection and prompts you to secure your router with a password. The web interface isn't particularly attractive, but it's easy

to navigate around and includes some extremely useful features.

These include up to six wireless guest networks: three on each band. These are ideal if you want to give visitors access to the internet, but not your local network, and you can even set a time at which they'll expire, which is particularly useful if you want to leave them open rather than protecting them with a password. There are also basic parental controls: a time-management screen lets you determine when specific devices are allowed on the network.

We tested the AC68U's wireless capabilities with our Centrino 2 laptop's integrated Wi-Fi adaptor, but this is relatively old hardware now and can't match the full speed of an 802.11ac router at 5GHz, nor does it support 2.4GHz TurboQAM. At 2.4GHz, we saw transfer speeds of 32.8Mbit/s at 10m and 9.7Mbit/s at 20m when using our laptop's



Wi-Fi. The next step was testing with Asus's £60 USB-AC53 Wi-Fi adaptor, which achieved speeds of 64.8Mbit/s at 10m and 23.6Mbit/s at 20m.

In our 5GHz test, even our laptop's integrated wireless chipset worked well with the router to produce speeds of 63Mbit/s at 10m and 25.5Mbit/s at 20m. Using an 802.11ac wireless dongle again more than doubled performance, producing speeds of 158.5 at 10m, which slipped to a still fantastic 70.7Mbit/s at 20m. Even better was the router's performance in conjunction with the £70 PCE-AC68 PCI-E wireless adaptor, which saw it maintain a transfer speed of 149.9Mbit/s at a distance of 20m.

This is one of the most expensive routers around, and few people will be able to justify the price of both this and the PCI-E adaptor required to achieve its optimal transfer speeds. However, if you need the fastest Wi-Fi, the RT-AC68U is the ultimate router.



## BELKIN AC 1200 DB



£125 inc VAT • From [www.argos.co.uk](http://www.argos.co.uk)

### VERDICT

This ADSL 802.11ac router is capable but a little overpriced compared to others with similar features and performance

**THOUGH IT'S DESIGNED** for use with ADSL, the Belkin AC 1200 DB doesn't actually have a built-in modem. Instead, it ships with an ADSL modem built into the power supply. This makes the power connector look like a bulky HomePlug unit, but means you need only one plug socket for both modem and router. The plug socket has a built-in RJ-45 port, but this is actually an ADSL input and takes your RJ-11 phone cable. It's unusual, but everything works.

There are two cables from the modem/plug: one supplies power and the other connects to a yellow WAN port marked Modem. You can't use a standard Ethernet WAN connection because the current firmware doesn't support this. There also are four Gigabit Ethernet ports and two USB ports, for connecting external hard disks and sharing printers over your network.

The AC 1200 DB stands upright and looks fairly snazzy, but you can't wall-mount it. There aren't many status lights, either: just one at the front, with a WPS button below it.

The AC 1200 DB's web interface doesn't take the glossy, simplified approach, but it's easy to see what's what. Worth noting is the content-filtering option, which allows you to use one of three block categories: malicious sites; malicious and adult sites; and malicious, adult and non-family-friendly sites. Custom content filtering is not available, though. The router's Intellistream QoS feature doesn't give such fine control as some, but it's easy to use. Enable it, and automatic priority will be given to high-bandwidth, low-latency services such as voice chat, video streaming and online games. With this enabled, the router will also plot a chart of your internet traffic by type.

Simultaneous dual-band Wi-Fi networks are secured by default using the supplied security key. A 2.4GHz guest network is also enabled by default, allowing you to give visitors access to the internet but not your network. We tested the router using both our

## WIRELESS ROUTERS



Centrino 2 laptop's integrated wireless chipset and Belkin's £20 802.11ac F9L1106v1 USB wireless adaptor. Our laptop supports both 2.4GHz and 5GHz, but only up to 802.11n speeds. The router uses the AC1200 standard, which has a theoretical maximum speed of 867Mbit/s.

Using our laptop's wireless chipset at 2.4GHz, we saw transfer speeds of 34Mbit/s at 10m and 11.4Mbit/s at 20m. This compares to the Belkin adaptor's performance of 51.7Mbit/s at 10m and a poor 4.9Mbit/s at 20m. On the 5GHz band, our laptop achieved 33Mbit/s at 10m, but failed to maintain a connection when we took it into the next room for the 20m test. Using the own-brand adaptor, we saw 76.3Mbit/s at 10m and 264Mbit/s at 20m. These are decent results.

If it were cheaper, this capable ADSL router would have earned four stars, despite its unconventional non-integrated modem. However, BT's Home Hub 5 is faster, costs roughly the same and is a little easier to use.

## BILLION BiPac 6300NXL



£80 inc VAT • From [www.ilgs.co.uk](http://www.ilgs.co.uk)

### VERDICT

This business-orientated router has lots of features an SMB might need but is held back by poor wireless performance and a relatively high price

**BILLION'S CHUNKY ROUTERS** aren't much to look at, but the company has forged a reputation for reliable hardware with all the features a home, small or medium-sized office needs. The BiPac 6300NXL is a Gigabit Ethernet router that can also connect to the 'net via a 4G mobile broadband dongle. It's described as a fibre router, but it doesn't actually have a built-in modem for this so you'll still have to connect it to the one supplied by your ISP.

At the back of the router are connectors for its two detachable wireless antennas. The ports are also at the back: one Gigabit WAN port, four Gigabit LAN ports and two USB3 ports. There's also a power switch, a factory reset button and a WPS button.

The wireless network isn't protected by a password by default, so your first move is to follow the instructions in the supplied manual to secure your Wi-Fi. Although Billion's web interface may look daunting, it's clearly laid out and the Quick Start wizard helps you configure all the critical features, including

connecting to mobile broadband. The router supports a wide range of dongles, details for most major UK networks are in the manual.

Wireless performance was disappointing. Only the 2.4GHz 802.11n standard is supported but, even so, transfers were unacceptably slow. Our test environment is admittedly cluttered by devices using the same band, but other routers, including many from Billion, have performed better in the same circumstances.

Using our Centrino 2 laptop's integrated wireless adaptor, we saw speeds of 18.9Mbit/s at 1m, 19.5Mbit/s at 10m and 7.9Mbit/s at 20m. Billion's BiPac 301OND adaptor fared even worse: 18.7Mbit/s at 1m, 14.9Mbit/s at 10m and 7.1Mbit/s at 20m. These were the best results we were able to obtain after significant trial and error using different channels. The router's ineffective automatic channel detection always defaulted to channel 11, which was cluttered and slow in our labs.

If wireless isn't that important, this router is otherwise well equipped. You can set up



your 3G connection as a backup option should your main internet connection fail, isolate different Ethernet ports to create separate virtual networks and set port ranges or IP addresses for QoS traffic prioritisation. Unlike other routers in this test, you have to configure this manually rather than use menus that let you choose popular programs or types of traffic to prioritise, but this also gives you a great deal more control over what gets dibs on your 'net connection.

No concessions are made to those who aren't comfortable with networking or prepared to read through the documentation, even for something as simple as plugging in an external USB drive and making it accessible to the network. Even if you are a fan of Billion's no-nonsense interface, £80 is a lot to pay given this router's failings. We prefer the similarly priced Tenda W1800R, which supports the latest 802.11ac Wi-Fi standard. ☈



## WIRELESS ROUTERS

### BT Home Hub 5

COMPUTER  
SHOPPER  
BEST BUY



£129 inc VAT • From [www.shop.bt.com](http://www.shop.bt.com)

#### VERDICT

This eminently capable and easy to use router is one of the best money can buy

**THE HOME HUB 5** is BT's first 802.11ac router. Its long, narrow shape makes it one of the smallest AC routers we've seen; sadly, this design also makes it unstable when you have Ethernet cables connected to the back of it, despite its little swivel-out feet. We had to prop it up to keep it from falling on its face.

The Home Hub 5's modem supports ADSL and VDSL connections, and there's also a Gigabit Ethernet WAN port to connect to a cable modem, as you can use this router with any ISP. There's a USB port for hard disk or printer sharing and four Gigabit Ethernet ports.

You access the modem's web interface by visiting <http://bthomehub.home>, where a guided configuration process will help you get online. By default, both the 2.4GHz and 5GHz bands are secured using the password printed on the device and use the same SSID. If you want to be able to choose which band you connect to, you'll have to rename one of them.

The Home Hub 5's interface is less dense and cluttered than most, and although the

router isn't exactly feature-packed, it covers the essentials. The firewall's port forwarding interface includes a drop-down list of popular games and applications, but you can still define ports manually as you may require.

Smart Setup is enabled by default and detects when new devices connect. Provided the router is connected to BT Broadband, a setup wizard appears the first time the device connects to reveal the available BT services, such as parental controls. The wizard is a little annoying, and stopped our home automation box working, so we recommend disabling it in the settings menu.

For many, it's the absence of overwhelming settings, as well as the clear, plain English descriptions, that will appeal. The other key factor is performance. Although our Centrino 2 reference laptop and its internal wireless adaptor are a bit old, the 2.4GHz throughput rate it produced in our tests was among the fastest we've seen, achieving 87Mbit/s at 1m, 76.7Mbit/s at 10m and a less outstanding



11.9Mbit/s at 20m.

At 5GHz, the integrated adaptor achieved 83.9Mbit/s at 1m, 78.9Mbit/s at 10m and 14Mbit/s at 20m.

BT couldn't supply us with an 802.11ac wireless adaptor to match the router, though it does produce such an adaptor. Instead, we used a Buffalo AC866, which performed well in most of our transfer speed tests, as did the router. In our 2.4GHz test, we got 1m and 10m transfer speeds of 61.5Mbit/s and 64.6Mbit/s, but couldn't get a stable connection at 20m in our interference-riddled test environment. At 5GHz, we saw a fantastic 158.5Mbit/s at 1m, 149.2Mbit/s at 10m and 58.2Mbit/s at 20m.

With excellent overall performance and a great set of features, the BT Home Hub 5 is one of the most capable 802.11ac routers around. Whatever you need to connect it to, it's up to the job, making it well worth its price. It wins our Best Buy award.

### BUFFALO TECHNOLOGY

#### AirStation Dual Band 11AC WZR-1166DHP



£92 inc VAT • From [www.uk.insight.com](http://www.uk.insight.com)

#### VERDICT

Powerful, capable and easy to use, this is one of the best 802.11ac routers around

**THE WZR-1166DHP IS** a simultaneous dual-band router with a 2.4GHz 802.11n and a 5GHz 802.11ac network, the latter's theoretical maximum throughput being 866Mbit/s.

The router is fairly chunky, but its matt black finish means it can sit in a dark corner without being too noticeable. It's a standard Ethernet router, without an ADSL or VDSL modem built into it, which makes it ideal for use with cable or fibre services where you're given a modem and left to get on with it.

At the back is a four-port Gigabit Ethernet hub and a Gigabit Ethernet WAN port. Above those is a USB3 port to connect a printer or external hard disk. We were pleased to find an eject button, so you can safely remove connected disks without having to log into the web interface to unmount them.

In a well-considered design touch, as well as the copy of the default Wi-Fi password being on the bottom of the router, it's also on

a removable plastic slip that you can take to the computer you're trying to connect. It would have been even more convenient had Buffalo labelled its 5GHz and 2.4GHz networks as such, rather than as A and G.

Using our laptop's built-in Centrino 2 wireless chipset, we saw 2.4GHz transfer speeds of 46Mbit/s at 1m, 36.1Mbit/s at 10m and 11.5Mbit/s at 20m; all fairly respectable. We were pleased to find our laptop could connect to the router in 5GHz mode without our having to change the router's settings. Its performance was impressive: 69.1Mbit/s at 1m, 87Mbit/s at 10m and 42.6Mbit/s at 20m.

Using Buffalo's own dongle didn't boost 2.4GHz performance, but 5GHz speeds were remarkable. In our 2.4GHz test, we saw speeds of 41.7Mbit/s at 1m and 36.9Mbit/s at 10m. It failed to connect at 20m. The 5GHz transfer speeds, on the other hand, were very quick: 158.5Mbit/s at 1m, 109.7Mbit/s at 10m and



47.7Mbit/s at 20m.

The web interface's main page makes it easy to adjust critical features, such as your wireless settings and passwords, Norton ConnectSafe content filtering and QoS to determine what kind of content gets priority access to your internet connection. Advanced settings include options to customise a wireless guest network, run a media server and download content via an integrated BitTorrent client, as well as the usual port forwarding and IP filtering options you'd expect to find in any decent router.

At a little under £100, the WZR-1166DHP is reasonably priced for an 802.11ac router, while its very quick performance, excellent interface and wide-ranging features make it one of the best we've reviewed to date. However, the Tenda W1800R also performs well and costs a fair bit less.



## WIRELESS ROUTERS

### D-LINK DSL-3580L



£100 inc VAT • From [www.dabs.com](http://www.dabs.com)

#### VERDICT

Plenty of options, but a slightly unfriendly interface and poor 2.4GHz performance at distance means there are better alternatives

**MOST ROUTERS** are happy for you to just plug them in, but a large orange label slapped over the DSL-3580L's ports insists you use the setup CD first. While this may be useful for those unfamiliar with router configuration, the setup disc's long-winded approach is likely to irritate more experienced users, not to mention those on optical drive-free laptops.

You'll need to set Wi-Fi passwords for both the 2.4GHz and 5GHz connections, which are not secured by default. The router has a built-in ADSL modem, but also supports Ethernet WAN connections, such as those from a cable or VDSL modem, and even 4G connections via a USB dongle. The USB3 port can also be used to share a printer or connect an external hard disk, which you can use as the target for the router's built-in storage server: a simple single-disk NAS.

D-Link hasn't gone out of its way to simplify its web interface. You have easy access to a wealth of detailed configuration options for everything from your ADSL

settings to QoS to prioritise different kinds of traffic and business-oriented features such as support for SNMP remote management tools.

Like most 802.11ac routers, the DSL-3580L is quite chunky. It stands upright, has a glossy black finish and a bank of status lights. At the back of the router are the ADSL, Gigabit Ethernet WAN and USB3 ports, along with four Gigabit Ethernet LAN ports. There's a power switch for the router and separate buttons to enable and disable the 2.4GHz and 5GHz wireless networks. A WPS button is located on the right of the device.

We tested the router with our laptop's integrated Centrino 2 wireless chipset, which supports 2.4GHz and 5GHz 802.11n Wi-Fi, and D-Link's own DWA-182 USB Wi-Fi dongle, made to support the same AC1200 standard as the router itself. Sadly, 2.4GHz performance was poor, and no amount of tweaking of settings on our part made for any notable improvement. Both integrated chipset and

dongle failed to maintain a 2.4GHz connection at 20m, but the dongle performed the better of the two, achieving 74.1Mbit/s at 1m and 62.3Mbit/s at 10m, compared to 50.4Mbit/s at 1m and 45Mbit/s at 10m from the Centrino 2 laptop.

The best results were on the 5GHz band with our laptop's integrated Wi-Fi, which achieved a good throughput of 83.9Mbit/s at 1m, 74.6Mbit/s at 10m and 43.4Mbit/s at 20m. Using the D-Link dongle at 5GHz, we were unable to maintain a connection at 20m but saw 60.2Mbit/s at 10m and 93.2Mbit/s at 1m. Performance with our PCI-E Wi-Fi adaptor at 5GHz over 20m was 54.5Mbit/s, which is decent but not particularly notable.

The DSL-3580L is cheaper than most other 802.11ac ADSL routers and even compares well to some 802.11n dual-band routers. However, its intimidating interface and poor performance over long distances means we'd rather spend more on the BT Home Hub 5.



### LINKSYS EA6900



£125 inc VAT • From [www.digital-fusion.co.uk](http://www.digital-fusion.co.uk)

#### VERDICT

Plenty of features and a good hardware specification are let down by poor performance in our speed tests

**THE LINKSYS EA6900** is an AC1900 wireless router, so it should be one of the fastest. It has a theoretical maximum throughput of 1,300Mbit/s when using 5GHz 802.11ac, and its wireless chipset also supports the Turbo-QAM standard, which can theoretically bring 2.4GHz 802.11n performance up to 600Mbit/s.

There are three replaceable antennas, a Gigabit WAN port, four Gigabit Ethernet ports, one USB3 and one USB port. These are all at the back, as are a power switch and a WPS button. Like most AC routers, it's a bit chunky.

The wireless network comes with a pre-set password, so there's no chance of anyone accessing your network while you're setting up the router. By default, both the 2.4GHz and 5GHz wireless networks have the same SSID: if you want to make it clear which one you're connecting to, you'll want to rename one.

The web interface's smart setup wizard automatically searches for firmware updates and lets you change the default passwords. You can create a Linksys Smart Wi-Fi

Account, which enables the router's optional remote administration features.

Features include a wireless guest network and basic parental controls that let you define when a device is allowed online and add a blacklist of undesirable sites. A QoS media prioritisation tool not only lets you assign priority to selected applications, but also lets you select specific machines, so the living room Netflix connection need never be slowed just because someone's playing online games. If you connect a USB drive, you can set it up as an FTP server, network share or DLNA media server; you can also use a USB port to share a printer across your network.

Sadly, performance was poor compared to most of its AC rivals when we tested the EA6900 with both our laptop's integrated wireless chipset and the Linksys WUSB6300 adaptor, which is expensive at £40.

At 2.4GHz, neither adaptor could maintain a connection to the router in our 20m test, which was disappointing, though our test



environment suffers from a lot of 2.4GHz interference. Speeds at 1m and 10m were good; with the laptop adaptor, we saw speeds of 37.3Mbit/s at 1m and 33.6Mbit/s at 10m, while the Linksys adaptor managed a superb 87Mbit/s at 1m and 83.9Mbit/s at 10m.

At 5GHz, our laptop's 802.11n adaptor failed to maintain a connection at 20m but managed speeds of 61.5Mbit/s at 1m and 57.3Mbit/s at 10m. Unsurprisingly, we saw the best results using the 802.11ac WUSB6300 at 5GHz, although its transfer speeds of 83.9Mbit/s at 1m, 78.8Mbit/s at 10m and just 8.4Mbit/s at 20m were poor compared to other AC routers. Its speed in our 20m test using the Asus PCE-AC68 PCI-E adaptor was a decent 54.5Mbit/s, though.

The EA6900 has lots of features, but the cost of the matching wireless adaptor and its poor performance means we'd rather save some money and buy the BT Home Hub 5.



## WIRELESS ROUTERS

### NETGEAR D6200



£124 inc VAT • From [www.ebuyer.com](http://www.ebuyer.com)

#### VERDICT

A wide range of features and fast 5GHz performance appeals, but the web interface leaves something to be desired

**IF YOU WANT** a small, inconspicuous router to sit in the corner of your sitting room, the Netgear D6200 isn't for you. It's a rectangular black wedge a little larger than a hardback book and sits upright on an integrated stand. It's also expensive, but you get a lot of features. The D6200 supports 802.11ac 5GHz Wi-Fi with a theoretical maximum throughput of 867Mbit/s, as well as the 2.4GHz band still used by many mobile devices and laptops.

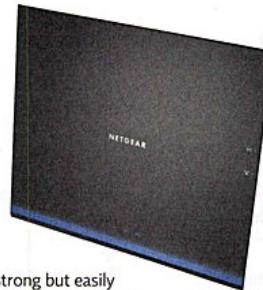
The router has both an ADSL modem and a Gigabit Ethernet WAN port, so you won't have to throw it away if you switch to a cable or VDSL service. There are also four Gigabit Ethernet LAN ports and a USB port, which can be used to attach an external hard disk or share a USB print server. A power button and recessed reset switch are at the back, while buttons to start a WPS connection and enable or disable the Wi-Fi are on the right.

Illuminated icons on the glossy front surface show the status of various features and connections. The wireless connection is

secured by default, with a strong but easily readable password. When you first connect to the router's IP address, it helps you establish an internet connection. Like Netgear's mobile and desktop apps, the web interface uses Netgear Genie branding and icons.

However, we found the D6200 could be slow in responding, particularly if it failed to detect an active internet connection. We also found that some aspects of the interface felt disjointed. For example, clicking on Parental Controls takes you to a download site where Mac OS and Windows users can download an OpenDNS content filtering plugin. Even once you've set up filtering, you can't access its control screen directly from the router, but instead have to run an application on your PC.

The advanced options screen is better and gives you access to a wide range of features, including wireless guest networks, blacklisting for specific sites, setting up a VPN and using a built-in DLNA media server to share content on an attached USB disk.



We tested Wi-Fi using our laptop's integrated wireless

chipset and a Netgear A6100 USB

Wi-Fi adaptor. In our 2.4GHz test, the results of our throughput tests were fairly close, but the laptop's wireless chipset did a little better, getting 45.8Mbit/s at 1m, 45.9Mbit/s at 10m and 11.8Mbit/s at 20m. The A6100 adaptor failed the 20m test. In the 5GHz test, the difference between the Wi-Fi standards began to show. While our laptop did fairly well, getting 76.3Mbit/s at 1m, 74.2Mbit/s at 10m and 13.2Mbit/s at 20m, the 802.11ac USB dongle gave us 139.8Mbit/s at 1m, 135.9Mbit/s at 10m and a speedy 48.4Mbit/s at 20m.

The flexible WAN connection options and good performance in our tests are both points in the D6200's favour, but its interface is a little disjointed, particularly when it comes to optional elements such as content filtering. It's a good router, but the BT Home Hub 5 has a better interface, even though it doesn't have as many features as the D6200.

### TENDA W300D



£21 inc VAT • From [www.ilgs.co.uk](http://www.ilgs.co.uk)

#### VERDICT

If you just need to get online at little cost, this budget ADSL modem router could be exactly what you need

**THE TENDA W300D** is one of the cheapest wireless ADSL modem routers around. It has two non-replaceable antennas and supports MIMO for a theoretical maximum wireless throughput of 300Mbit/s. It also has four 10/100 Ethernet ports, one of which can also be used as an Ethernet WAN port. This adds to the router's flexibility if you switch from a standard ADSL internet connection, as you can use it with an external cable or fibre modem provided by your ISP.

Also on the rear is a power button and a button that doubles as a WPS connection button and, if you press and hold it, a factory reset switch. While this combination invites mishaps, we didn't have any problems during testing. A bank of lights at the front tells you which ports are connected, whether there's an internet connection and if it's working properly.

The web interface is clearly laid out, but there aren't a lot of features. If you want to use your router to share USB hard disks or set up a guest network for visitors, you should look

elsewhere. However, it's easy to access vital features such as port forwarding and wireless settings.

Sadly, the router's Wi-Fi connection isn't encrypted by default. This means that, as soon as you connect to its wireless network, you should log into the web interface and set a password to prevent unwanted guests using your wireless network. When you connect to it via your browser, it opens a basic settings page that prompts you to set your location. Do this accurately, as it determines which frequency bands can be used; European Wi-Fi bands extend from channels one to 13, while the US is limited to using channels one to 11.

You're also asked to enter your internet connection type, username and password. Finally, enter an easily memorable passphrase into the Security Key box. This is your wireless password, vital in keeping your network secure. Unusually, even in the advanced settings, we were unable to disable channel-bonding, which we usually do while testing, as doing



so typically improves transfer speeds.

Performance was acceptable in our near and far tests using our laptop's Centrino 2 wireless chipset.

We saw transfer speeds of 31.3Mbit/s at 1m and 27.7Mbit/s at 10m, but we were unable to complete the test at 20m. A £7 Tenda W311U USB Wi-Fi adaptor gave us similar results of 37.2 Mbit/s at 1m and 23.6m at 10m, so it's not worth buying the adaptor, particularly as ours was unable even to see the router when it was set to channels 12 or 13.

This is a cheap router with a decent interface, so we were prepared to be forgiving when it came to performance. If you need to shunt a lot of data around on your network or play games using it, this isn't the router for you. If you primarily use a wired connection and just need to be able to get your phone or tablet online, then this basic router is a bargain. It wins our Budget Buy award.



## TENDA W1800R



£76 inc VAT • From [www.ilgs.co.uk](http://www.ilgs.co.uk)

### VERDICT

The cheapest 802.11ac router we've yet seen was also one of the most consistent performers in our challenging test environment

**THE TENDA W1800R** is one of the cheapest 802.11ac wireless routers you can buy. This is surprising as it uses the fast AC1750 standard, with a theoretical maximum throughput of 1,300Mbit/s. Like most AC routers, it's a bit larger than its 802.11n predecessors. It sits flat and has three replaceable antennas.

There's a bank of status lights on the front, while at the back you'll find a Gigabit Ethernet WAN port, two USB ports, four Gigabit Ethernet LAN ports and a button that serves as both the factory reset and the WPS button. It's not an ideal combination of functions, but we had no problems with it during our tests.

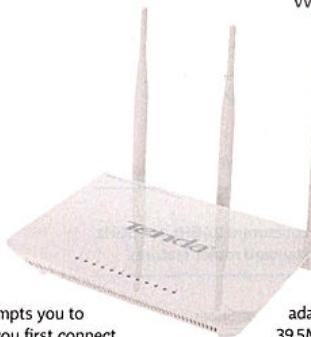
The W1800R provides simultaneous dual-band Wi-Fi: a 2.4GHz 802.11n connection, still required by many laptops and mobile devices, and a 5GHz 802.11ac connection, which is faster but requires a compatible Wi-Fi adaptor for the full benefit of its faster throughput. Neither channel is secured by default, so the first thing to do is log into the router and add a wireless password.

The web interface prompts you to add a security key when you first connect to it, but as the suggested option is 12345678, you should change it. Enter your chosen key, click OK and you're almost ready to go. Click on the Advanced section of the web interface, select the Wireless tab and correct the country entry. The router annoyingly defaults to America, which uses a slightly different set of wireless channels. There's no UK option, but France uses the same ranges as us, so pick that. The 5GHz settings option is locked to America if you want to use 802.11ac mode. Once again, the US and European authorised ranges differ, but you've got no choice here.

Luckily, these quirks have little impact on performance. We used Tenda's £20 W900U Wi-Fi adaptor, which supports 802.11ac, and our laptop's integrated wireless chipset, which supports both the 2.4GHz and 5GHz bands but only uses the older 802.11n standard.

At 2.4GHz, we saw similar performance from the laptop's integrated Wi-Fi and the

## WIRELESS ROUTERS



adaptor. The laptop managed 39.5Mbit/s at 1m, 38.2Mbit/s at 10m and 14Mbit/s at 20m. That last figure is particularly good. With the adaptor, we saw a slight improvement, to 42.7Mbit/s at 1m, 40.7Mbit/s at 10m and 15.3Mbit/s at 20m.

Performance at 5GHz was good all round. Transfer speeds at 20m were a little slower than some, but the connection was strong. Using integrated wireless, we got 87Mbit/s at 1m, 80.6Mbit/s at 10m and 12.6Mbit/s at 20m. The adaptor took it to 119Mbit/s at 1m, 158.5Mbit/s at 10m and 25.2Mbit/s at 20m.

This is the one of the cheapest 802.11ac routers we've reviewed, and proves you don't have to sacrifice performance or features to save money. You'll need a compatible wireless adaptor to get the most out of its 802.11ac performance, but it worked well with our Centrino 2 laptop in all our tests. It's a great router, but its lack of UK settings means it just misses out on an award. If you can afford it, the BT Home Hub 5 is the better choice.

## TRENDNET TEW-812DRU



£85 inc VAT • From [www.dabs.com](http://www.dabs.com)

### VERDICT

This excellent 802.11ac wireless router doesn't cost too much, but you can get more consistent performance for a little less money elsewhere

**TRENDNET'S TEW-812DRU IS** a bit smaller and lighter than most 802.11ac routers, but this AC1750 simultaneous dual-band device is still specified with a theoretical maximum 5GHz transfer speed of 1,300Mbit/s. It has a Gigabit WAN port and four Gigabit Ethernet ports but, beyond that, you're limited to one USB port, a power switch and a WPS button.

Wireless networks have passwords set by default, and the web interface's wizards help you configure your internet connection and customise your wireless security.

The interface is clear, with the advanced settings kept separate from those that will interest most users. However, some features are obtuse. The QoS settings, to prioritise the types of traffic on your connection, are a case in point. Where other routers let you choose specific programs or types of traffic, here you have to add rules based on IP address, protocol and port. Even these settings are buried under configurable traffic settings that most will find virtually incomprehensible.

Wireless settings are much clearer, though again it's easy to stumble across advanced settings that most people will want to steer well clear of. You can enable extra wireless guest networks on both bands, so you can give visitors access to the internet without letting them roam your local network at will. In the advanced settings screens, you can configure firewall rules that are only active at specified time, which is good for keeping the kids offline at night, and set up all the usual port-forwarding rules and static IP addresses. We've seen more user-friendly interfaces, but at least everything's clearly labelled.

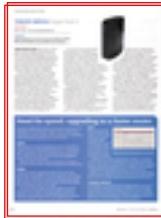
The router also has network share (SMB) and FTP server features, which you'll find in the Administrator settings and can use to share a USB hard disk connected to the port at the back, turning the router into a simple NAS device. You can also share a USB printer, but will have to install the Windows-

only Trendnet control utility on every system from which you want to access the printer.

We tested wireless performance with our Centrino 2 laptop's integrated wireless chipset and a £25 Trendnet TEW-805SUB USB Wi-Fi adaptor. Using our laptop's adaptor, which supports 802.11n 5GHz but not 802.11ac, our 5GHz test produced speeds of 82.4Mbit/s at 10m, but the connection was unstable at 20m in our busy labs. Our 2.4GHz test using the same internal adaptor gave us 37.7Mbit/s at 10m and 15.9Mbit/s at 20m. When we tested with the Asus PCE-AC68 PCI-E wireless adaptor, we saw an amazing transfer speed of 80.4Mbit/s at 20m.

With a clear interface, effective wireless performance, lots of features and a low price, the TEW-812DRU is an excellent choice if you want to enter the world of high-speed Wi-Fi. However, the BT Home Hub 5 maintained a more stable connection during its testing in the same interference-filled environment.





## WIRELESS ROUTERS

### VIRGIN MEDIA Super Hub 2



£50 inc VAT • From [www.virginmedia.com](http://www.virginmedia.com)

#### VERDICT

A good upgrade if you want concurrent 2.4GHz and 5GHz Wi-Fi, but it still lacks many standard router features

**VIRGIN MEDIA'S NEW** Super Hub, or Super Hub 2 as we're calling it, has simultaneous 802.11n 2.4GHz and 5GHz Wi-Fi, so you can use one for general compatibility and reserve the other for important high-bandwidth jobs such as streaming HD video. There are five internal aerials, two for 2.4GHz and three for 5GHz. This gives the latter a theoretical maximum transfer speed of 450Mbit/s.

On the bottom of the router is a sticker showing your router's SSIDs (one for each band), password, WPS PIN, plus the web address and default password for the router's setting pages (more on which below). A new addition is the QR code on the side, which lets you connect a mobile device simply by pointing its camera at the sticker, as long as you have the right software installed.

At the back is a full set of four Gigabit Ethernet ports, so there should be no problem connecting multiple high-speed devices for fast file transfers. There's a USB port here, too, but it's been stickered over and there's no mention of it in the settings menu.

In our tests we found the 2.4GHz Wi-Fi speed was respectable at 1m and 10m distances, scoring 45Mbit/s and 33Mbit/s respectively, but it fell off sharply in our 20m test, failing to complete the test or register a score. We set the router to its maximum speed for these tests, though, and in another location we did get a clear signal at this range by reducing the theoretical maximum speed down to 144Mbit/s. This will affect speeds of closer devices, but for 2.4GHz range and stability are the key factors for most users, and in this respect the Super Hub 2 worked fine.

At 5GHz the router was more impressive, scoring 93.2Mbit/s at 1m, 74.1Mbit/s at 10m and 13Mbit/s at 20m. All these tests are conducted through multiple walls in a place with higher-than-normal electrical interference. There are certainly faster routers out there, even discounting 802.11ac devices, but these are respectable scores.

There aren't many features on this device, there's no support for storage devices or



printers and no media server. There aren't even any dynamic DNS server settings. It's not surprising; Virgin Media is providing straightforward internet access here, and anything extra would go unused by most customers and generate a lot of support calls. Still, having print and storage servers would have made this a more rounded device.

The Super Hub 2 is provided free to new XL, XXL and 100Mbit/s and 120Mbit/s broadband customers. Those already on those speeds, or upgrading to them, can request a new Super Hub to replace their current model, but it will cost £50. The kit is owned by Virgin Media and you merely rent it, which means it will be replaced if anything goes wrong.

At £50 the Super Hub 2 is a good upgrade if you want better speeds and increased range over the current model, without losing the neat all-in-one look. However, for more features we recommend switching the router into modem mode and hooking up a more capable router, such as the BT Home Hub 5.

## Need for speed: upgrading to a faster router

If you were supplied with a wireless router when you took out your broadband connection but aren't happy with the speed you're getting from it, you can simply replace it using one of the routers reviewed this month. The process differs, depending on the ISP and type of connection, but here's what to look out for.

#### ADSL

ADSL remains the most common type of internet connection in the UK and, if you've been with the same ISP for a long time, you could be running very old hardware. You'll need a router with an ADSL modem built-in. Talk to your ISP and make sure you have your broadband username and password, and any additional settings, such as the VCI number.

Plug your ADSL router into your phone line and configure it using the information above and the manufacturer-provided details.

#### FIBRE

In areas where BT has upgraded to fibre to the curb (FTTC), replacing your ISP-provided router with your own is easy. First of all, you need to disconnect your current router from the provided VDSL modem, which will most likely be a BT Openreach modem. Next, plug your new router into the modem, connecting its WAN port to the Ethernet port on the modem.

You now need to configure your new router to work with your internet connection. This should simply be a matter of setting the router to PPoE, then entering the username and password, as provided by your ISP. For BT Infinity, the username is [bthomehub@btbroadband.com](mailto:bthomehub@btbroadband.com) with a blank password.

#### SKY

Sky is very restrictive with its routers, using hidden usernames and passwords, and the uncommon MER authentication protocol to stop people using other routers. There are ways round this, but not all routers support the necessary features.

Interfaces: WAN

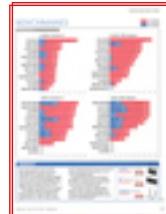
Protocol	PPPoE
Subnet mask	255.255.255.0
Default gateway	192.168.0.254
Primary DNS	192.168.0.1
Secondary DNS	192.168.0.1

► No matter what kind of router you use, you'll need the connection information from your ISP

Instead, you can use any router (cable or ADSL) in conjunction with your Sky router. First, disable Wi-Fi on your Sky router. Next, turn your new router on, and connect to it directly using a computer. Using its web-based management, turn off DHCP, set its IP address to 192.168.0.254 (remember this address, as you'll need it to configure your router), and set up its Wi-Fi. Save the settings. Now plug an Ethernet cable into one of the Ethernet ports (not the WAN port) on your new router, and the other end into your Sky router.

#### VIRGIN MEDIA

Virgin Media's current router has the modem built-in, but you can use any cable router with an Ethernet WAN port. On your Virgin Super Hub, go to Advanced settings and set the router to Modem mode. Connect your new router's WAN port to port 1 on the Super Hub and it should work. Because of Virgin's broadband speeds, it's best to buy a router with a Gigabit Ethernet WAN port.



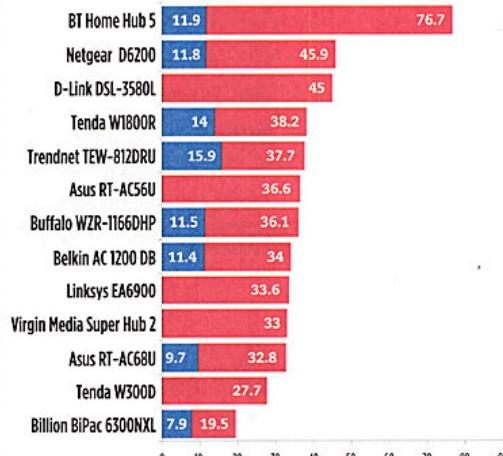
## WIRELESS ROUTERS

### BENCHMARKS

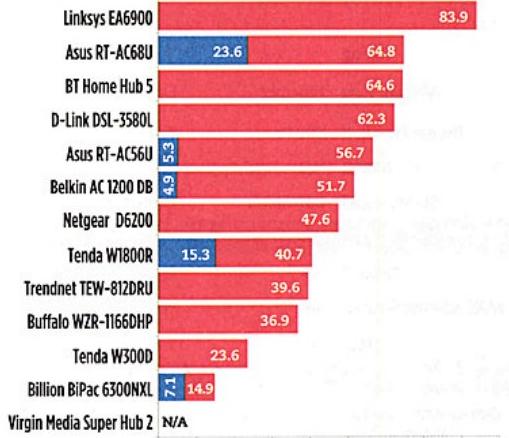
10 metres  
20 metres

Performance (see box on page 101)

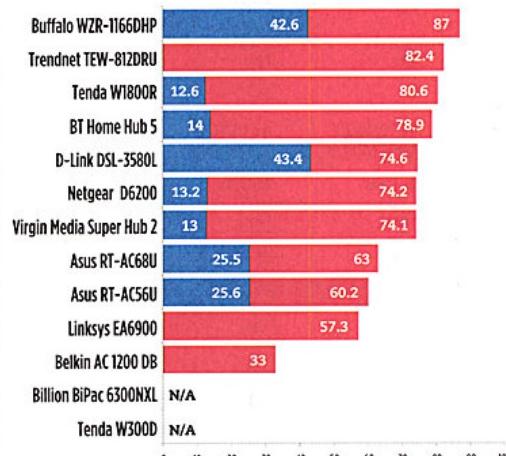
#### 2.4GHz Centrino 2



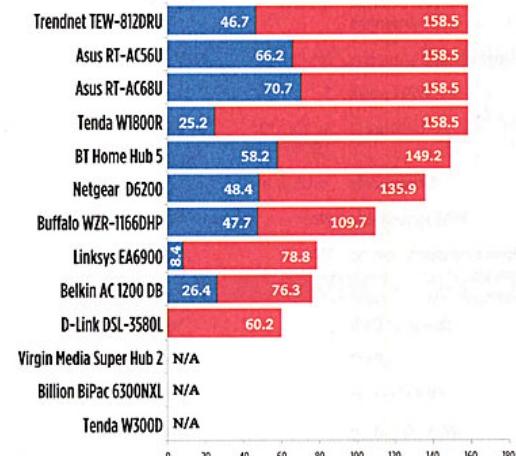
#### 2.4GHz USB adaptor



#### 5GHz Centrino 2



#### 5GHz USB adaptor



### VERDICT

If you want to step into the world of high-speed 802.11ac routers, you don't necessarily have to spend a fortune. This point is proved by the low-cost Gigabit Ethernet router, the Tenda W1800R, which you can buy for less than £80. However, its slightly clunky interface and lack of UK settings means it just loses out on an award.

For excellent performance and support for both ADSL and fibre broadband, the BT Home Hub 5 is a great choice. It has Gigabit Ethernet, a clean, simple interface

and it's well priced. Best of all, you don't have to have a BT internet connection to use it. It wins a Best Buy award.

Our final 802.11ac winner is the Asus RT-AC68U. It's expensive, but it produced the fastest wireless transfer speeds we've seen. It nets our Ultimate award.

At the other end of the spectrum, if you just need to replace a failing ADSL or Ethernet router and get back online, you can't go wrong with our Budget Buy winner, the £21 Tenda W300D. ☺

#### ASUS RT-AC68U

★★★★★ COMPUTER SHOPPER ULTIMATE



#### BT Home Hub 5

★★★★★ COMPUTER SHOPPER BEST BUY



#### TENDA W300D

★★★★★ COMPUTER SHOPPER BUDGET BUY





## WIRELESS ROUTERS

	ASUS	ASUS	BELKIN	BILLION	BT	BUFFALO TECHNOLOGY
RT-AC56U	RT-AC68U	AC 1200 DB	BiPac 6300NXL	Home Hub 5	AirStation Dual Band 11AC WZR-1166DHP	
Rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Modem type	Ethernet	Ethernet	ADSL	None	ADSL, Ethernet	None
Router standard	802.11ac	802.11ac	802.11ac	802.11n	802.11ac	802.11ac
MIMO	Yes	Yes	Yes	Yes	Yes	Yes
Stated speed	867Mbit/s	1,300Mbit/s	867Mbit/s	300Mbit/s	1,300Mbit/s	866Mbit/s
<b>SECURITY</b>						
Firewall	Yes	Yes	Yes	Yes	Yes	Yes
MAC address filtering	Yes	Yes	Yes	Yes	Yes	Yes
DMZ	Yes	Yes	Yes	Yes	Yes	Yes
<b>PHYSICAL</b>						
Dimensions including antenna (lying horizontally, HxWxD)	205x147x66mm	160x220x83mm	220x220x75mm	37x230x155mm	116x236x31mm	212x34x183mm
Antennas	4	3	Not disclosed	2	Not disclosed	Not disclosed
Internal/external antennas	Internal	External	Internal	External	Internal	Internal
Upgradeable antennas	No	Yes	No	Yes	No	No
WAN ports	1	1	1	1	2	1
LAN ports	4x 10/100/1,000Mbit/s	4x 10/100/1,000Mbit/s	4x 10/100/1,000Mbit/s	4x 10/100/1,000Mbit/s	4x 10/100/1,000Mbit/s	4x 10/100/1,000Mbit/s
Other ports	1x USB, 1x USB3	1x USB, 1x USB3	2x USB	2x USB	1x USB	1x USB3
Wall mountable	No	No	No	Yes	No	No
Power consumption on	7W	9W	9W	3W	6W	7W
<b>OTHER FEATURES</b>						
Dynamic DNS	Yes	Yes	Yes	Yes	Yes	Yes
UPnP	Yes	Yes	Yes	Yes	Yes	Yes
DHCP server	Yes	Yes	Yes	Yes	Yes	Yes
MAC spoofing	Yes	Yes	Yes	Yes	Yes	Yes
Port forwarding	Yes	Yes	Yes	Yes	Yes	Yes
WDS support	Yes	Yes	Yes	Yes	Yes	Yes
USB device support	Yes	Yes	Yes	Yes	Yes	Yes
QoS	Yes	Yes	Yes	Yes	No	Yes
<b>BUYING INFORMATION</b>						
Price including VAT	£112	£177	£120	£80	£129	£92
Warranty	Three-year RTB	Three-year RTB	One-year RTB	Two-year RTB	One-year RTB	Three-year RTB
Supplier	<a href="http://www.dabs.com">www.dabs.com</a>	<a href="http://www.morecomputers.com">www.morecomputers.com</a>	<a href="http://www.argos.co.uk">www.argos.co.uk</a>	<a href="http://www.ilgs.co.uk">www.ilgs.co.uk</a>	<a href="http://www.shop.bt.com">www.shop.bt.com</a>	<a href="http://www.uk.insight.com">www.uk.insight.com</a>
Details	<a href="http://www.asus.com">www.asus.com</a>	<a href="http://www.asus.com">www.asus.com</a>	<a href="http://www.belkin.com/uk">www.belkin.com/uk</a>	<a href="http://www.billion.com">www.billion.com</a>	<a href="http://www.bt.com">www.bt.com</a>	<a href="http://www.buffalo-technology.com">www.buffalo-technology.com</a>
Part code	RT-AC56U	RT-AC68U	F9J1106	6300NXL	Home Hub 5	WZR-1166DHP

Prices correct at time of going to press



## WIRELESS ROUTERS

### BUDGET BUY

D-LINK	LINKSYS	NETGEAR	TENDA	TENDA	TRENDNET	VIRGIN MEDIA
DSL-3580L	EA6900	D6200	W300D	W1800R	TEW-812DRU	Super Hub 2
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
ADSL	ADSL, Ethernet	ADSL, Ethernet	ADSL	Ethernet	Ethernet	Cable
802.11ac	802.11ac	802.11ac	802.11n	802.11ac	802.11ac	802.11n
Yes	Yes	Yes	Yes	Yes	Yes	Yes
867Mbit/s	1,300Mbit/s	867Mbit/s	300Mbit/s	1,300Mbit/s	1,300Mbit/s	450Mbit/s
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
173x213x52mm	185x257x41mm	205x255x77mm	31x172x119mm	34x219x157mm	180x48x155mm	215x69x195mm
6	3	Not disclosed	2	3	6	5
Internal	External	Internal	External	External	Internal	Internal
No	Yes	No	Yes	Yes	No	No
2	1	2	1	1	1	1
4x 10/100/ 1,000Mbit/s	4x 10/100/ 1,000Mbit/s	4x 10/100/ 1,000Mbit/s	4x 10/100Mbit/s	4x 10/100/ 1,000Mbit/s	4x 10/100/ 1,000Mbit/s	4x 10/100/ 1,000Mbit/s
2x USB	1x USB, 1x USB3	1x USB	None	2x USB	1x USB	None
No	No	No	Yes	Yes	No	No
5W	9W	7W	3W	8W	8W	8W
Yes	Yes	Yes	Yes	Yes	Yes	No
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	No
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	No
Yes	Yes	Yes	No	No	Yes	No
£100	£125	£124	£21	£76	£85	£50
One-year RTB	Two-year RTB	One-year RTB	One-year RTB	One-year RTB	Three-year RTB	Lifetime
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